

## **QUALIFICATIONS AND FORMS TO BE INCLUDED WITH BID PROPOSAL**

SUBMISSION OF ORGANIZATION RECORD, BID PROPOSAL, & STATEMENT OF QUALIFICATIONS FORM--The Organization Record form must be completed and signed by the Contractor. The names and signatures of persons authorized to sign documents for the Contractor must be on this form. Signatures authorized on the Organization Record, or by a Power of Attorney, on file with the State prior to bid opening or is submitted with the Bid Proposal are the only signatures allowed on the Bid Proposal. Signatures not approved will be cause for rejection of the Bid Proposal as irregular and unauthorized

The State will furnish each Bidder a standard Bid Proposal form, which when completed shall be submitted as the Bid Proposal. The Bid Proposal must be signed by the Contractor or authorized agent, as stated above. All blanks on the Bid Proposal form shall be completed. Bid Proposals not presented on this form, as furnished, may be disregarded.

The Statement of Qualifications must be completed and signed by the Contractor or authorized agent as stated above. The Statement of Qualifications should include equipment that the Contractor owns and has available for this contract

A pre-qualification test is required before a Contractor will be assigned a project. An inspection of the Contractor's site will be held prior to assignment of a project. The purpose of the site inspection is to determine to the satisfaction of the Contract Manager, that the Contractor is in full compliance with general specifications of this contract. A Contractor will be allowed to bid before pre-qualifying provided the Contractor has completed the Statement of Qualifications and meets the minimum requirements to do 3-D digital map compilation.

STATEMENT OF QUALIFICATIONS --The Bidder must submit the Statement of Qualifications that specifies the following:

- A. The Bidder's required one (1) year previous experience in compiling 3-D digital topographic mapping.
- B. The Bidder's ownership and availability for use as part of the Bidder's regular operation:
  - An analytical plotter of the following types or equal: Wild BC1, Wild BC2, or Leica BC3. Optical/mechanical to analytical plotter conversions and soft copy systems must be approved by the ESC on an individual basis.
  - A plotter table or off-line plotter; identify make and model.
  - A computer graphics system; identify make and model.
  - DTM software; identify the name, version, and manufacturer.

The award of the contract will be to a ranked series of Contractors beginning with the lowest responsible bidder whose bid complies with the requirements prescribed.

## STATEMENT OF QUALIFICATIONS

Describe one (1) year required experience in 3D digital compilation of topographic mapping. \_\_\_\_\_

---

---

---

---

Make and model of analytical stereo plotters or soft copy instruments. \_\_\_\_\_

---

---

---

---

Make and model of plotter table or off-line plotter . \_\_\_\_\_

---

---

---

Make and model of computer graphics system. \_\_\_\_\_

---

---

---

Specify name, version and manufacturer of the Digital Terrain Model (DTM) software. \_\_\_\_\_

---

---

---

NAME OF COMPANY \_\_\_\_\_ TELEPHONE (     ) \_\_\_\_\_

NAME \_\_\_\_\_ SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

## Article I - Description

Contractor shall provide all labor, materials and equipment to Compile 3-D Digital Topographic Mapping and provide associated optional reproductions, on a periodic basis throughout the contract period. The work is ordered at various scales and contour intervals. Orders for work will range from compilation of one stereo-model to a maximum of 50 stereo-models. The average size will be between 10 and 15 stereo-models. The services will be performed for the Department of Transportation, Engineering Service Center, Engineering Technology, Office of Photogrammetry located at 1727 30th Street, Sacramento, CA.

The following Attachments are hereby incorporated herein and made a part of this agreement.

Attachment A -	Contractor Bid Proposal
Attachment B	Recycle Certification
Attachment C	Standards and Symbols for Photogrammetric Mapping (SSPM)

## Article II - Contract Management

- A. Caltrans Contract Manager is Robert R. Gurss, (916) 227-7649.
- B. The Project Manager for the Contractor is\_\_\_\_\_.

## Article III - Contract Period

This contract shall begin on **July 10, 2000**, contingent upon approval by the State, and expire on **December 31, 2003**, unless extended by amendment.

## Article IV - Contract Specifications

### A. BID/CONTRACT DEFINITIONS

- 1-1.01 **ASC No.** - Aerial Survey Contract Number.
- 1-1.02 **ACCEPTANCE** - After receipt and inspection of all required work and materials, the acceptance of the work by the Contract Manager.
- 1-1.03 **AUTHORIZED AGENT** - A representative of the Contractor, indicated on the organization record or Power of Attorney on file with the State, to sign documents, receive, and fulfill instructions from the Contract Manager.
- 1-1.04 **CALTRANS** - The State of California, Department of Transportation
- 1-1.05 **CONTRACT AMENDMENT** - Written agreements executed by the Contractor and by the State, covering alterations, amendments, or extensions to the contract, as hereinafter provided.
- 1-1.06 **CONTRACT MANAGER** - An authorized representative of the State who manages and monitors contracts, acting either directly or through delegated State personnel.
- 1-1.07 **CONTRACTOR** - The business, partnership, corporation, or combination thereof, private or municipal, who have entered into a contract with the State, as party or parties of the second part, or an authorized agent of the same.

- 1-1.08 **DAYS** - Contract working days, excluding Saturdays, Sundays and State holidays, unless otherwise designated.
- 1-1.09 **DEPARTMENT OF TRANSPORTATION** - The Department of Transportation of the State of California, as created by law.
- 1-1.10 **ESC** - The State of California, Department of Transportation, Engineering Service Center, Division of Engineering Technology, Office of Geomtronics, Photogrammetry Branch.
- 1-1.11 **FILE** - A digital format, MicroStation design file, for delivery of a project.
- 1-1.12 **FILE TRANSFER PROTOCOL (FTP)** - The application used to transfer files from one computer location to another computer location.
- 1-1.13 **LIQUIDATED DAMAGES** - Amount of money prescribed in the specifications, to be paid to the State or deducted from moneys due, or may become due, the Contractor for each day's delay in completing the whole, or specified portion, of work beyond the time limit allowed by the specifications.
- 1-1.14 **MAP** - A unit of compilation which can be delivered in either a digital file format and/or a plotted sheet format. This unit is typically in three (3) model increments.
- 1-1.15 **ORDER LETTER** - A letter to the Contractor from the Contract Manager which orders flying and/or compilation for a specific location and may include special instructions.
- 1-1.16 **ORGANIZATION RECORD** - A pre-qualification form which, when completed by the Bidder, constitutes the official record of that organization. This form will be referred to for contract award purposes as well as for contract administration purposes.
- 1-1.17 **PLANS** - The project maps, layouts and drawings, or reproductions thereof, which show the location, coverage, dimensions, and details of the work to be performed. All such documents are to be considered a part of the contract.
- 1-1.18 **RATES** - a.)-Unit Bid Prices, submitted to and accepted by the State, for individual contract bid items as described herein.
- 1-1.19 **RUSH ORDER** - Orders requiring an accelerated delivery time for compilation, as prescribed in the specifications.
- 1-1.20 **SPECIFICATIONS** - The directions, provisions, and requirements pertaining to the method and manner of performing the work of the individual orders, or to the quantity and quality of materials in the individual order furnished under this contract.
- 1-1.21 **SSPM** - Standards and Symbols for Photogrammetric Mapping--The sheet showing the symbols for digital mapping. This will be given to the Contractors at the pre-job conference.
- 1-1.22 **STATE** - The State of California, Department of Transportation.
- 1-1.23 **STATEMENT OF QUALIFICATIONS** - A pre-qualification form which, when completed verifies the Contractor or Authorized Agent has the equipment necessary to work on this contract

- 1-1.24 **WORK** - All the work specified or contemplated in the contract including all alterations, amendments, extensions, or other written orders of the Contract Manager.

## **B. SCOPE OF WORK**

1. **CONTRACT APPROVAL**--Subsequent to contract approval, the Contractor shall begin work immediately after receiving instructions to proceed with an aerial photography order. Expeditious service and prompt delivery shall be a requirement under this contract. If necessary, the Contractor shall keep all essential equipment and personnel on the project to complete the work within the required time limits.
2. **INTENT OF PLANS, SPECIFICATIONS, AND SAMPLE PLANS**--The intent of the plans, specifications, and samples is to prescribe the details for performance and completion of the work which the Contractor undertakes in accordance with the terms of the contract. If the plans, specifications, or sample plans describe portions of the work in general terms, but not in complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used. Unless otherwise specified, the Contractor shall furnish all labor, material, and equipment, and do all the work involved in executing the contract.

## **C. LEGAL RELATIONS AND RESPONSIBILITY**

1. **PERMITS AND LICENSES**--The Contractor shall procure all permits and licenses, pay all charges and fees, and give notices necessary and incidental, for the lawful prosecution of the work.
2. **RESPONSIBILITY FOR DAMAGE**--The Contractor shall be responsible for any liability imposed by law and for injuries to or death of any person or damage to property and shall indemnify and save harmless any county, city or district, its officers and employees connected with the work, within the limits of which county, city or district the work is being performed hereunder, all in the same manner and to the same extent as provided above for the protection of the State and all officers and employees thereof connected with the work, except that no retention of money due the Contractor under and by virtue of the contract will be made by the State pending disposition of suits or claims for damages brought against the said county, city or district.

Nothing in the contract is intended to create the public, or any member thereof, a third party beneficiary hereunder, nor is any term and condition or other provision of the contract intended to establish a standard of care owed to the public or any member thereof.

## **D. PROSECUTION AND PROGRESS OF WORK**

1. **CONTROL OF THE WORK**--The Contract Manager shall decide all questions which may arise as to the quality and acceptability of material furnished and work performed and as to the manner of performance and rate of progress of the work; all questions as to interpretation of the plans, specifications, and samples; all questions as to acceptable fulfillment of the contract on the part of the Contractor; and all questions as to compensation. The Contract Manager shall have final authority to enforce and make decisions on orders the Contractor fails to carry out promptly.
2. **MATERIAL, LABOR AND EQUIPMENT**--The Contractor shall furnish all material, labor, and equipment necessary to complete the work; and shall complete the work and deliver

to the State all work described in individual order letters. All work shall be executed in an expeditious and professional manner to the satisfaction and acceptance of the State and in the manner and time prescribed in these specifications.

The Contractor shall obtain advance approval of the Contract Manager in writing/fax on any changes contemplated in the equipment to be used during the course of this contract from that equipment listed on the Statement of Qualifications submitted with the Contractor's bid. The Contractor shall also notify the Contract Manager in writing/fax, within five days, of changes in personnel listed as an authorized agent on said Statement of Qualifications.

The Contract Manager shall have access to the Contractor's plant and other operations during normal working hours, and shall be furnished every reasonable facility for ascertaining that the work complies with the specifications and that the Contractor has the required equipment and materials specified in the Statement of Qualifications. All work shall be subject to inspection and approval by the Contract Manager.

3. **SPECIFICATIONS, PLANS, SAMPLES, AND AMENDMENTS**--Specifications, plans, samples, and amendments, are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be cooperative, and to describe and provide a complete contract.
4. **ASSIGNMENT OF WORK**--3-D digital topographic mapping compilation projects will first be assigned to the Contractor with the lowest total bid cost (Contractor A). When, in the opinion of the Contract Manager, Contractor A has a full workload and can no longer meet the specified time limits for compilation and required corrections of regular and rush orders, projects will then be assigned to Contractor B, C, D, etc.

As Contractors complete assigned projects, additional work may be assigned to them, as determined by the Contract Manager, under the following conditions:

- Projects will be assigned to the lowest total bid cost Contractors available, i.e. Contractor A first, Contractor B second, Contractor C third, etc.
  - The Contractor agrees to deliver the specified materials by the delivery dates specified in the project order letter.
  - The Contractor's past delivery performance and quality of work has been satisfactory.
5. **REFUSAL OF WORK**--Each Contractor may refuse project assignments up to three times in any six-month period. If any Contractor refuses more than three project assignments in any six-month period, the Contract Manager may refuse to assign any additional work to the Contractor for the remaining duration of the contract.
  6. **LATE DELIVERY**--If preliminary or final maps for any project are delivered more than 10 working days late without justification or delivered substantially incomplete, the Contract Manager may refuse to assign any additional work to the Contractor for the remaining duration of the contract.
  7. **PROGRESS OF WORK**--Subsequent to the award of the contract, a mandatory pre-job conference will be scheduled by the Contract Manager. The pre-job conference will consist of a meeting between the Contract Manager and the Contractor prior to the beginning of work. The Contractor shall be prepared to thoroughly discuss a plan of

operations and all phases of the work. The pre-job conference will be held in Sacramento at the ESC or a suitable site in Southern California should one be found.

- a. The Contractor shall begin work after an order letter and materials for work are received. The work is required on a regular and rush basis.

8. **MATERIAL DELIVERY**--Material delivery shall conform to the requirements of G - Delivery.

9. **LIQUIDATED DAMAGES**--When the work called for under the contract is not completed within the time limits as set forth in these specifications or in each order letter, damage will be incurred by the State, it is difficult to determine the actual damage, therefore the Contractor will pay the sum of **\$20 per day**, to the State for each day's delay, in delivery of each map beyond the time limit(s) specified in each order. The payment of liquidated damages applies to both preliminary and final deliveries.

For the purpose of assessing liquidated damages, delivery of preliminary maps for checking will not be considered complete unless the control photographs, diapositives, and break-line quality assurance check plots, if so specified in the order letter, are delivered with the preliminary map files and optional sheets.

The Contractor agrees to pay liquidated damages as described and agrees that Caltrans may deduct the amount from any monies due or that may become due the Contractor under this contract.

10. **DELAYS IN COMPLETING THE WORK**--The Contractor shall not be assessed liquidated damages during any delay beyond the time named for the completion of the work caused by acts of God or of the public enemy, acts of the State, fire, floods, epidemics, quarantine restrictions, strikes, and freight embargoes due to such causes; providing that the Contractor notify the Contract Manager in writing/FAX of the causes of the delay within five days from the beginning of any such delay and the Contract Manager shall ascertain the facts and shall make a decision to be final and conclusive.

If the Contractor is delayed by reason of changes made under or by any act of Caltrans not contemplated by the contract, the time of completion will be extended correspondingly. The Contractor shall have no claim for any further extension or other compensation for any such delay.

In the event the Contractor is delayed in completing the work within the time allowance specified, or is unable to deliver any of the various items of work within the time allowances specified, for any reason whatsoever, the Contractor shall notify the State in writing / FAX within five days of the causes of such delay. The Contract Manager will ascertain the facts and the extent of the delay and may extend the time for completion of delivery of the various items of work, when the findings of acts justify such an extension.

11. **TERMINATION OF INDIVIDUAL WORK ORDERS**--If the Contractor has failed in any respect to ensure completion within the time specified in the contract and order letter, the Contract Manager may, upon five (5) days written notice to the Contractor, terminate the Contractor's control over the work and complete the work by State forces or by employment of other Contractors, or both. Upon such termination, the Contract Manager may take possession of and use all or any part of the Contractor's materials and completed or partially complete work.

If the Contractor's control of the work is terminated, said Contractor is not entitled to receive any portion of the amount to be paid under the contract until it is fully completed. After completion, if the unpaid balance exceeds the amount expended by the State in finishing the work, plus all damages sustained by the State, the excess not otherwise

required by law to be retained shall be paid to the contractor. If costs to the State exceed the unpaid balance, the Contractor is liable to the State for the excess.

12. **CHANGES**--The State reserves the right to make such changes in the work as deemed in the best interests of the State. Upon written notice by the State, the Contractor shall proceed with the work as changed and an equitable adjustment will be made therefor.

## **E. AERIAL PHOTOGRAPHY**

1. **GENERAL**--The State will furnish all aerial photographs and diapositives along with all control and mapping limits necessary to compile the required maps.

The nominal scale of the photographs and the current camera calibration data will be furnished with each order.

2. **DIAPOSITIVES**--In the event of any accidental damage, the damaged diapositives shall be salvaged and returned to the State.

The Contractor shall not mark on the diapositives. Any diapositive damaged or lost while in possession of the Contractor, including damage or loss during return shipment to the State, may, at the discretion of the Contract Manager, be replaced by the State at a cost to the Contractor of \$70 per diapositive. The total replacement cost will be withheld from the final payment.

## **F. CONTOUR AND PLANIMETRIC MAPS**

1. **STEREOSCOPIC PLOTTERS**--The topographic maps shall be digitally compiled on an analytical plotter, pre-approved optical/mechanical to analytical plotter conversion, or a pre-approved soft-copy plotter. Hard copies shall be produced using a precision output plotting device from the deliverable digital file.

2. **MAPS**--Maps shall be compiled at the scale and contour interval specified in each order.

The final topographic maps will generally be at a scale of 1:500, 1"=50', 1:200, or 1"=20'.

Units, mapping limits, title block data, and special instructions will be specified in each order.

3. **COMPUTER AIDED DRAFTING DESIGN (CADD)**--Caltrans will furnish the following updated data to each Contractor:

- Geometronics cell library, font library, custom line styles, seed files etc. available via internet @ <http://www.dot.ca.gov/hq/esc/geometronics/PHOTOGRAMMETRY.HTML>
- General CADD specifications.

4. **STANDARDS AND SYMBOLS FOR PHOTOGRAMMETRIC MAPPING (SSPM)**--Map symbols and map border data, including border grid ticks and values, map sheet numbers, adjacent map sheet numbers, etc., shall be as specified on the attached SSPM.

5. **ORDER LETTER**--An information order letter will be sent with each project. It will contain all the data needed to complete a project

- Global Origin to be used for project.



- Information for the title blocks
  - Mapping limits and sheet layout diagram.
6. **EDGE TIES**--Edge ties shall be butt-joined with no match line showing.
  7. **MAP SHEETS**--When specified in the order letter, the map files for preliminary checking may be plotted on single model sheets with three common grid ticks between adjacent models as specified on the SSPM.
  8. **MAP CONTENTS**--The maps shall show all features as shown on SSPM. All lines, custom line styles, cells, fonts, design planes, and seed files shall be applied as specified in SSPM utilizing various Geometronics resource files. These resource files can be downloaded from the Internet @  
  
<http://www.dot.ca.gov/hq/esc/geometronics/PHOTOGRAMMETRY.HTML>  
  
The use of line patterning is prohibited. Arc lines are prohibited. The use of non standard cells, or line style libraries are prohibited.
  9. **LABELS**--Show appropriate titles on items that have "label" in the instructions on SSPM. The Contractor shall not "break" any lines in order to clear the area around a label. All labels must be placed near true ground elevation.  
  
Districts may require some special labels, and/or some underground drainage facilities or utilities to be plotted and labeled. Instructions will be specified in the individual orders.
  10. **ALL FEATURES AT TRUE ELEVATIONS**--All map features shall be compiled at their true ground elevations. The vertical position (z coordinate) of these features shall be correct as well as the horizontal position (x, y coordinates). Refer to the SSPM for feature name, code, level, line style, and color.

Exceptions to features not compiled at true ground elevation are as follows:

- Trees shall be compiled at the approximate crown elevation.
- Buildings shall be compiled at roof elevation.
- Retaining walls shall be compiled at the top of wall elevation.
- All sheet data shown on levels 10 and 12 shall be set at a mean or average project elevation.

The distance between adjacent data points, that define the map features which are compiled at their true elevation, shall not exceed 30 m as measured on the ground along the feature. The use of excessive points, points spaced closer together than required to properly define the vertical and horizontal positions of the line, shall be avoided. The use of systems which automatically compile a point based on elapsed time or distance moved is prohibited. The use of systems which increase point density with supplemental interpolated points is prohibited.

11. **ADDITIONAL DATA FOR DIGITAL TERRAIN MODEL (DTM), LEVEL 11**-- Critical terrain break-lines and active points from spot elevations shall be placed on level 11 as specified on the SSPM. Data from level 11 shall not be shown when plotting maps for checking.
12. **TERRAIN BREAK-LINES, LEVEL 11**-- Terrain break-lines shall be compiled at their true ground elevations; i.e., the vertical position (z coordinate) of these features shall be correct as well as the horizontal position (x, y coordinates).

The distance between adjacent data points, which define the terrain break-lines on Level 11, shall not exceed 30 m as measured on the ground along the line. The use of excessive points, points spaced closer together than required to properly define the vertical and horizontal positions of the line, shall be avoided. The use of systems which automatically compile a point based on elapsed time or distance moved is prohibited. The use of systems which increase point density with supplemental interpolated points is prohibited.

Duplicate, crossing, or random terrain break-lines that do NOT represent a significant change in the slope of the terrain will not be measured as described in the Measurement and Payment Section.

13. **BREAK-LINE QUALITY ASSURANCE CHECKS**--When specified in the order letter, the Contractor shall check the break-line compilation by performing the following:
- a. Create a digital terrain model (DTM) from the following compiled data:
    - True elevation features
    - Terrain break lines on level 11
    - Active spot elevation points on level 11
    - Contour lines on level 7
  - b. Generate a contour map from the DTM created above.
  - c. Compare contours compiled with the stereo plotter to contours generated from the DTM.
  - d. In areas where reasonable correlation is not achieved, correct the compiled data by adding, deleting, and revising the terrain break-lines and by revising other compiled data as required to achieve satisfactory results.

The Contractor may use any DTM system to perform the required checking.

The materials to be delivered from the break-line quality assurance checks are specified elsewhere in this Proposed Form of Contract .

3-D digital topographic maps that have not been properly checked and corrected as specified above, as determined from a review of the deliverables by the Contract Manager, will be immediately returned to the Contractor for checking and corrections without any partial payment. The delivery of preliminary maps will not be considered complete until the necessary checking and corrections, as specified in this section, have been accomplished by the Contractor and all deliverables have been received.

14. **MONUMENTS, BENCH MARKS AND GRID SYSTEM**--Coordinate values will be shown on the final maps in an even coordinate, rectangular grid pattern as shown on the SSPM. In addition to this requirement, adjoining map sheets shall have at least three grid ticks common to both sheets. Intermediate 10 mm or 0.5-inch grid ticks shall be plotted using the widest base possible to fulfill this requirement. Any such intermediate grid ticks shall not be labeled.
15. **HORIZONTAL AND VERTICAL DATUMS**--The horizontal control furnished by the State may be based on the North American Datums of 1927 or 1983. NAD83 may include the epoch date designation. The vertical control furnished by the State may be based on the National Geodetic Vertical Datum of 1929 or the North American Vertical Datum of 1988 and may also include an epoch date designation.

Horizontal Datums/Coordinate Systems: Examples - NAD83 (1991.35), CCS Zone 2; or NAD27, CCS Zone 2. The required labeling information will be furnished with each order.

Vertical Datums: Examples - NGVD29 or NAVD88. The required labeling information will be furnished with each order.

16. **CONTROL POINTS**-- Control values will be furnished by the Contract Manager and shown as specified on the SSPM. The Contractor shall not edit any map feature to clear an area around and behind control cells. All control cells shall be placed at true ground elevation.

17. **CONTOUR AND SPOT ELEVATION REQUIREMENTS**--Contour and spot elevations shall be shown as specified on the SSPM

The Contractor shall not edit any map feature to clear an area around and behind contour annotation. All annotation must be placed at the contour elevation.

Contours shall reflect the crown or cross slope of all paved areas including paved ditches, and shall truly depict all drainage ways and dikes, the accuracy tolerance allowed for contours notwithstanding.

Contours at roadway under crossings and over crossings, depressions, hills, and other areas where slopes are rounded shall correctly depict the rounding. Straight lines between the data collection points representing these curves will not be allowed.

Where interpolation from the contours will not show correct elevations, such as summits, depressions, saddles and road intersections, spot elevations shall be shown.

The Contractor shall not edit any map feature to clear an area around and behind spot elevation points.

18. **DISCREPANCIES**--In the event that discrepancies should occur between information furnished by the State and information obtained by the Contractor in performance of a Contractor's work, the Contractor shall immediately notify the Contract Manager. The Contract Manager will investigate the facts, and advise the Contractor in writing, on how to resolve said discrepancy. The instructions issued by the Contract Manager shall be final and conclusive.

19. **PLANIMETRIC FEATURES**--Only features shown on the SSPM sheet shall be compiled unless otherwise specified in the order letter.

20. **SURFACE TYPES**--The surface type of all roads, drainage ditches, parking areas and other improved areas, except for private residential features, shall be interpreted from the aerial photographs and labeled as to type, i.e., asphalt, concrete, brick, dirt, etc.

Features which are interpreted from the photography as being under construction shall be labeled as such, and the resulting partially completed planimetric features shall be shown with lines of weight 0.

21. **ACCURACY OF MAPS**--All map accuracy requirements specified herein shall apply to the individual models that comprise the finished maps delivered by the Contractor.

The plotted position of all coordinate grid ticks and all monuments, except bench marks, shall not vary more than 0.25 mm from their calculated position.

At least 90 percent of all well defined planimetric features shall be within 0.6 mm of their true position, and all shall be within 1.2 mm of their true position.

The width of all curbed streets, vehicular structures, traffic lanes, and highway surfaces whose edges are well defined shall not vary more than 0.6 mm, at map scale, from their true width. The delineation of curbs shall be at the face of the curb.

At least 90 percent of all contours shall be within one-half contour interval of true elevation, and all contours shall be within one contour interval of true elevation, except as follows:

- a. In densely wooded areas where the ground is obscured by dense brush or tree cover, contours shall be plotted as accurately as possible, while making maximum use of spot elevations in places where the ground is visible and/or with elevations furnished by the State. **See SSPM sheet.**
- b. In those areas where spot elevations can be obtained photogrammetrically and/or if elevations are furnished by the State, at least 90 percent of all contours shall be within one contour interval or one-half the average height of the ground cover, whichever is the greater, of true elevation. All contours shall be within two contour intervals or the average height of the ground cover, whichever is the greater, of true elevation. Contours in such areas shall be indicated by dashed lines.
- c. The vertical accuracy of planimetric features useful as DTM break-lines and the terrain break-lines shall not be required to exceed that required for spot elevations, nor shall it be less than that expected of contours. Data points shall be compiled along these features such that they can meet the accuracy test applied to spot elevations. These data points shall be compiled frequently enough that when the vertical accuracy of the feature is tested between data points, it shall at the very least meet the accuracy test applied to contours. These data points shall not exceed 30m spacing.

Orchards, vineyards, and areas devoted to crops will generally be considered as open areas and are therefore not subject to larger tolerances in vertical accuracy.

22. **PAVED AREAS**--The accuracy tolerance allowed for contours shall not affect the requirement that contours reflect the crown or cross slope of all paved areas including paved ditches.
23. **SPOT ELEVATIONS**--In areas not obscured by grass, weeds, or brush, at least 90 percent of all spot elevations shall be within 0.25 contour interval of true elevation and all shall be within 0.50 contour interval of true elevation.
  - a. In addition to the accuracy specified above for contours and spot elevations, the following shall apply:
    - The arithmetic mean of contours and spot elevations in open areas shall not exceed plus or minus the following values for the points tested on each map sheet.

No. of Points Tested

Max. Arithmetic Mean

METRIC

U.S.

20	$\pm 0.24$ C.I.	( $\pm 0.20$ C.I.)
40	$\pm 0.18$ C.I.	( $\pm 0.15$ C.I.)
60 or more	$\pm 0.12$ C.I.	( $\pm 0.10$ C.I.)

- Any contour which can be brought within the specified vertical tolerance by shifting its plotted position 0.6 mm shall be accepted as correctly plotted.

## G. DELIVERY

1. **DELIVERY DATE**--Delivery dates will be specified in individual orders. The delivery date for preliminary maps for checking will be established as follows:

- a. Regular order

- Two days for delivery to the Contractor
- Two days for mobilization
- 1.2 to 3.0 days per model as determined by the Contract Manager.
- Five days for delivery to Caltrans.

- b. Rush order

- One day delivery to the Contractor
- One day for mobilization
- 0.7 to 1.1 days per model as determined by the Contract Manager
- Two days for delivery to Caltrans

The Contract Manager will establish the factor to be used to determine the preliminary delivery date based on the line density of the work assigned. High-density mapping such as urban areas and steep terrain will be based on a higher factor. Mapping of routine density and difficulty will be based on a 2.0 factor for regular orders and a 1.0 factor for rush orders.

A telephone contact will be made on each individual order to notify the Contractor of an impending order for work. The delivery date will be discussed at this time.

Caltrans will complete the checking of the maps within 30 days for regular orders and 20 days for rush orders.

When the preliminary files and optional sheets are returned for corrections, the Contractor shall complete all work and make final delivery within 10 days plus two days for delivery to Caltrans for regular orders. For rush orders the Contractor will complete all work and make final delivery within five days plus one day for delivery to Caltrans.

2. **DELIVERY**--Delivery means the date that all the materials specified in the order letter are received at the designated offices.

The film diapositives and control photos shall be carefully packed so that they cannot rub against each other or the container. They shall be shipped in a substantial flat container to prevent them from being bent or damaged in any way.

Delivery of all materials shall be made to the ESC Office in Sacramento unless otherwise specified in the order letter.

Delivery addresses of the Districts and ESC Office will be furnished prior to beginning work under this contract.

Delivery addresses of all successful Contractors awarded a contract will be furnished prior to beginning work under this contract.

The Contractor shall pay the delivery cost of all material shipped to the State and edge tie materials shipped to other Contractors. Rush orders shall be delivered by overnight delivery or hand carried.

3. **DELIVERY MEMORANDUM**--The Contractor shall provide a delivery memorandum in triplicate for all shipments made to the State. The shipping memorandum shall itemize all material in the package and identify it with the contract and order numbers. The package shall also be labeled on the outside with the contract and order numbers.
4. **MATERIAL DELIVERY**--Delivery of material shall be as follows:

**PRELIMINARY DELIVERY -**

- a. One set of preliminary MicroStation design files shall be transferred to the State's FTP server utilizing self-extracting Zip compression file format (.exe). After completion of file transfer, the Contractor shall notify Photogrammetry of delivery via FAX/EMail.
- b. When specified in the order letter, one set of plots of the preliminary maps, on 0.1 mm double matte polyester base film, for checking. The sheets shall not include any break-lines from Level 11 as specified in the SSPM. The map plots required for checking purposes may be in one model increments. The models shall have three common grid ticks with adjacent models as specified in SSPM.
- c. Preliminary topographic map sheet plots shall not have any distortions that render them unsuitable for checking purposes. Preliminary sheets that cannot be used for checking purposes will not be accepted by the State and the amount due the Contractor for the plotted sheets will be deducted from, but shall not exceed the 20-percent retention payment.
- d. When specified in the order letter, one set of plots on paper of the contour maps created from the break-line quality assurance checks as specified in H - Contour and Planimetric Maps. The quality assurance plots that are delivered shall correspond to, and be consistent with, the other materials delivered; i.e., same version, iteration, etc..
- e. Control photographs and diapositives.
- f. The State shall have the option to obtain from the Contractor (i.e. writing data to a compact disc and shipping it to the State) any intermediate work product the Contract Manager determines to be beneficial to the State.

**FINAL DELIVERY -**

- a. One set of preliminary MicroStation design files shall be transferred to the State's FTP server utilizing self-extracting Zip compression file format (.exe). After

completion of file transfer, the Contractor shall notify State of delivery via FAX/EMail.

- b. If specified in the order letter, one set of final sheets plotted on paper. The sheets shall not include any break-lines from Level 11 as specified in the SSPM.
- c. Return of the preliminary maps marked in red for corrections and any materials specified in 4, b above.
- d. Control photographs and diapositives. (If they were sent to contractor for corrections)
- e. If final polyester base film maps are required, it will be specified in the order letter.
- f. The State shall have the option to obtain from the Contractor (i.e. writing data to a compact disc and shipping it to the State) any intermediate work product the Contract Manager determines to be beneficial to the State.

## H. MEASUREMENT AND PAYMENT

1. **BASIS FOR PAYMENT**--Payment for 3-D digital map compilation will be based on line density, compilation area, and the measured length of terrain break-lines for each digital file compiled.

The area measured for payment of 3-D digital map compilation shall be the compiled area only and shall not include outside grid ticks, coordinate labels, north arrows, or title blocks. The area mapped shall be calculated to the nearest 0.01 square meter at map scale.

Payment for map reproductions shall be based on the compiled area. The compiled area, measured in square meters at map scale, will be multiplied by three (3) to determine the area of the reproductions. Mapping which fits longitudinally on 915 mm or narrower material shall be plotted as specified in the sheet layout diagram in the order letter.

2. **LINE DENSITY**--The line density will be determined by counting all graphic feature intersections along the perimeter of a 250 mm square or along any 1000 mm line representative of the compiled map sheet at map scale.

Level 11 will not be included in the line count when determining the line density.

Unit price per square meter of map compilation and drafting will be broken down into nine line density categories:

A .Under 100	f. 201-225
b. 101 - 125	g. 226-250
c. 126 - 150	h. 251-275
d. 151 - 175	i. 276-Over
e. 176 - 200	

3. **EXTRA SERVICE**--Payment will be made for extra service at an hourly rate billed to the nearest 0.1 hour. Extra service shall be used only on the written instruction and approval of the Contract Manager.

4. **TERRAIN BREAK-LINES**--Terrain break-lines that represent significant changes in the slope of the terrain as specified on the SSPM will be paid for by the linear meter at map scale as a separate item. Duplicate, crossing, or random terrain break-lines that do NOT represent a significant changes in the slope of the terrain will not be measured.
5. **TERRAIN BREAK-LINE QUALITY ASSURANCE CHECKS**--A separate payment for performing the terrain break-line quality assurance checks, as specified elsewhere in this Proposed Form of Contract will be made when requested in the order letter. The terrain break-line quality assurance check work will be measured by the square meter at map scale and the quantity will be the same quantity paid for 3-D digital map compilation.
6. **RUSH ORDERS**--A rush surcharge will be added to the price of all rush orders in accordance with the contract prices.
7. **PLANIMETRIC ONLY MAPPING**--For planimetric only mapping, a 25-percent surcharge will be added to the compilation price and paid for by the State. This surcharge, at the discretion of the Contract Manager, may be applied to projects that have exceptionally narrow limits.
8. **PROGRESS PAYMENT**--Upon delivery and acceptance by the Contract Manager of the digital files and optional preliminary maps, control photographs, diapositives, and break-line quality assurance plots (if specified in the order letter) for checking purposes, the State shall pay the Contractor 80 percent of the amount due and shall retain the balance until all work under the order has been accepted. Identification on the warrant will be the Contract Number.

The progress payment shall not be construed to be acceptance of any defective work.
9. **FINAL PAYMENT**--Final payment of the balance retained by the State shall be made to the Contractor upon completion and acceptance of all work to be furnished under each order.

## **I. INSPECTION AND TESTING OF DELIVERED MATERIALS**

1. **GENERAL**--The State reserves the right to reject any materials which do not meet specifications.
2. **ACCEPTANCE OR REJECTION**--Maps will be tested and inspected after delivery by the Contractor and will be accepted or rejected within 30 days, beginning on the day of the State's receipt of all map sheets and related items for each increment of work as specified for delivery in each order letter. If a Contractor has two (2) orders rejected within three (3) months and if it is in the best interest of the State, said Contractor may be removed from the list of contractors for the remainder of the contract period.
3. **REJECTED MAPS**--Within 20 days plus two days for delivery for regular orders or within 10 days plus one day for delivery for rush orders, after notification of rejection and receipt of materials for each specified delivery increment, the Contractor shall, at the Contractor's own expense, correct and resubmit all rejected map sheets so that they comply with the specifications.
4. **COST OF TESTING**--The cost of initial testing and inspecting of the work under each delivery prior to acceptance or rejection shall be borne by the State. Before accepting any previously rejected work, the Contract Manager will retest the material. Should the resubmitted work fail to comply with the specifications, the cost of re-testing required to



prove that the material meets the specifications may be assessed against the Contractor. Such assessments against the Contractor will be deducted from any monies due.